



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

From: Chris Rhyne and Nancy Hunt

To: Stephen Heare, Acting Director
Permits and State Programs Division

Subject: Report on DSSI Field Trip

On January 25, 1998, members of the Solid Waste Office (Hunt, Joglekar, Ordaz, McAlister and Rhyne) visited the Diversified Scientific Services, Inc. (DSSI) facility in Kingston, Tennessee. DSSI is a subsidiary of Chem-Nuclear Systems, which is further a subsidiary of Chemical Waste Management. This facility, located in Kingston, Tennessee, owns and operates a boiler system that produces steam to generate electric power from hazardous/radioactive (mixed) waste fuels.

The DSSI facility is situated on approximately 80 acres (7 acres are controlled access) with an office building on Gallaher Road, a process building located just north of the office building, and a bulk liquid storage tank farm located on the north side of the process building.

The process building, or facility, is located within a perimeter fence along with a run-off/fire control pond, the bulk liquid storage tank farm, and support equipment shelters and outbuildings. This is designated by DSSI as the active area. The process facility is divided into four main sections. The Live Drum Room (LDR) is the storage area for drums of liquid waste material shipped to the facility. The LDR has a storage capacity of approximately 95,000 gallons. The Process Room is used to open, decant and rinse the drums of waste. Other sections include the Boiler Room and the Futures Area.

The Boiler Room houses the steam and power producing equipment. Boiler off-gas cleaning or "scrubbing" systems are located in the exhaust piping and in the Scrubber Room. Further cleaning of the off-gas and building air is accomplished in the Filter Room and Fan Room by high efficiency particulate (HEPA) filters. These filters remove minute particles of airborne pollution before final release of the exhaust to the environment. To assure proper waste destruction the boiler is equipped with an extractive continuous air monitoring (CEM) system. The Futures Area stores mixed wastes and houses maintenance equipment. Other rooms are used

for process support services and equipment, operator conveniences, and process controls.

The Bulk Liquid Storage Tank Farm is located north of the process building and contains four (4) sixty-five-hundred (6,500) gallon tanks and one (1) seventy-eight-hundred (7,800) gallon tank with a total capacity of approximately 30,000 gallons. The tanks are used to store liquid waste material shipped to the facility.

DSSI indicated that the process employed by the facility is within the air quality standards of the State of Tennessee and the Environmental Protection Agency (EPA). Emissions are controlled in accordance with the EPA "Burning of Hazardous Waste in Boilers and Industrial Furnaces" (BIF) regulations and the Tennessee "State Regulations for Protection Against Radiation." The boiler is capable of combusting liquid waste fuels that include miscellaneous organic chemicals and radioactive materials. In addition, the boiler burns commercial propane fuel to aid in the process of thermal destruction.

The facility is licensed by the State of Tennessee Divisions of Radiological Health, Air Pollution Control, Water Pollution Control, Solid Waste Management and the Environmental Protection Agency for storage and treatment of liquid mixed waste. According to DSSI, radiation levels emitted by the process are very low and add little to the background exposure that an individual might receive. The background (natural) radiation level at and around the DSSI site is approximately 80 mRem per year. The highest yearly occupational (in the facility) exposure to an employee has been 100 mRem as recorded by personal dosimetry. DSSI also noted that as long as they meet the 100 mRem annual exposure limit at the facility boundary, NRC does not have prescriptive requirements on whether the mixed waste has to be stored in sheltered areas or meet similar RCRA requirements.

DSSI blends liquid mixed waste into fuel using an on-site laboratory for waste analysis and profiling to assure complete destruction of hazardous constituents. All products containing hazardous chemicals (including all cleaners, lubricants, paints, glues, etc.) must be accompanied by a Material Safety Data Sheet (MSDS). Products containing hazardous chemicals are not allowed to be brought on site without a MSDS.

All hazardous/radioactive waste is stored in areas that are posted with signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL." Areas with the potential for contamination or where waste containers are opened are posted with restrictive requirements (CSCA, RWP Required for Entry, Contact Health Physics Prior to Entry, etc.).

Upon our arrival at the facility, we were introduced to Richard Dabolt, DSSI General Manager, David Ebenhack, vice-president of Chem-Nuclear Systems (as mentioned, a subsidiary of Waste management, Inc. and DSSI's parent company), and Assef Azadeh, DSSI's Manager of Marketing and Sales. We received an excellent overview of DSSI's history and facility operations (see above). We also toured the facility and found it clean and well managed. The tour included

the boiler room, APCS room, drum storage area, tank farm, electrical generating control facility, boiler control room, and laboratory. The two most impressive parts of the facility were the newly constructed interconnected tank farm (mentioned above) and the computerized control room that controls the materials blending and burning operation (Preset mixture and emissions limits built into the computer program will automatically shut down the boiler operation should those limits be exceeded.)

DSSI explained to us their waste acceptance process from initial customer contact to final waste destruction. Aside from gaining a clearer understanding of DSSI's operation, we were able to get a better handle on the capabilities and limitations of the facility. All RCRA waste codes (subject to limitations mentioned later) except F020-F027 could potentially be treated. Examples of wastes that could be treated included solvents, scintillation media, pumpable paints, oils, and hydraulic, thermal, and barrier fluids. Radioactive isotopes approved for processing include numbers 1-83, 88, 90, and 92-96. DSSI does not have a Toxic Substances Control Act permit, and therefore may not treat PCBs.

DSSI provides turnkey service. They will, when necessary, perform brokerage services and acceptance sampling at the customer's site as well as van, flatbed, and tank truck transportation. DSSI also provides a certificate of destruction to its clients when the waste has been treated. This is particularly comforting to those clients concerned with future superfund liability.

DSSI's boiler unit ash goes to Envirocare of Utah, Inc.'s land disposal facility for stabilization and final disposal. It was noted that the waste acceptance criteria at Envirocare can limit what DSSI burns. However, DSSI indicated this has not, thus far, been an issue.

Several specific questions were asked in order to clarify DSSI's capabilities. For example, we asked about limitations for organics and were told that organics must be "pumpable" (i.e., no sludges are accepted), and that highly halogenated organics were also not accepted (presumably to prevent the formation of dioxins during combustion). DSSI recognized these as significant limitations. Therefore, in order to expand DSSI's capability to receive additional waste forms, by the end of the year they intend to add thermal desorption technology to treat solids such as sludges, unpumpable greases, and soils. Thermal desorption technology will remove and destroy organic contaminants (e.g., halogenated and non-halogenated organics VOCs and SVOCs, and PCBs), as well as remove volatile metals (e.g., mercury), without combustion.

We also found that the facility had an excellent compliance record. DSSI has undergone a number of audits by the nuclear utility industry as well as other industries, and has done very well. According to DSSI, they have never failed an audit. (Their performance on nuclear utility audits was confirmed by several of the facilities we visited.)

With regard to the facility's capacity and utilization, DSSI stated that the facility's annual treatment capacity is approximately 800,000 gallons of waste at an 80% capacity factor.

However, DSSI has averaged less than 80,000 gallons per year from 1994-1997. As a result, operation of the boiler is intermittent. Production of electricity is, therefore, also intermittent.

DSSI management felt that nuclear power plants were the cause of a large part of the facility's low utilization. According to DSSI, nuclear power generating stations were, presumably, holding on to treatable mixed waste because of the RCRA mixed waste enforcement policy. So far, our experience doesn't indicate that nuclear power plants are holding significant amounts of treatable mixed waste. While it is still not clear from a national standpoint (i.e., considering hospitals, universities, and other mixed waste generating facilities) how much mixed waste is being stored on site that might be treated, it seemed clear to us that DSSI was greatly underutilized for several other reasons. First, the cost of treatment is high, partly because DSSI is the only game of their kind in town. One company revealed to us that in 1997 it cost \$110,000 to treat ten fifty-five-gallon drums at DSSI. Second, and more important, we have found in our review of nuclear power plant operations that waste minimization has become a crucial part of the daily operation of nuclear power generating facilities. Some of the plants visited have not generated mixed waste of any kind in years. Others are generating very small volumes of mixed waste annually. Now that treatable legacy wastes are off site, the power plant mixed waste market appears to be drying up for DSSI. Thirdly, and perhaps most important, DOE, with likely the largest share of treatable mixed waste, continues to hold on to its waste. In any event, DSSI recommended that the RCRA mixed waste enforcement policy not be extended.

When asked about their opinion of a rule allowing decay-in-storage for hospitals, universities, and other facilities generating short-lived radionuclides, DSSI thought it made sense from safety and economic points of view. They indicated that it would have little economic impact on their operations.

Finally, we requested analytical data for the mixed waste streams they handle. DSSI expressed a willingness to provide the data with concentration ranges. Since we have not received the promised information to date, HWID plans to initiate further contact with DSSI.